

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

Claims 1-33 (Canceled)

34 (New). A method of treating living cells, said method comprising extracellularly administering to said cells a polyamide nucleic acid oligomer containing neutral amide backbone linkages which is complementary to a target nucleic acid, under conditions wherein said oligomer engenders a biological response associated with said target in a sequence specific manner, said administration being in vivo.

35 (New). The method of claim 34, wherein said method comprises detecting said biological response.

36 (New). The method of claim 34, wherein said cells are within a mammal.

37 (New). The method of claim 34, wherein said polypeptide participates in cell signaling.

38 (New). The method of claim 34, wherein said biological response is a modification of polypeptide expression.

39 (New). The method of claim 38, wherein said modification is a reduction in polypeptide expression.

40 (New). The method of claim 34, wherein said biological response is characterized by a physiological change in a living organism.

41 (New). A method of treating a mammal, said method comprising:

a) extracellularly administering to said mammal a polyamide nucleic acid oligomer containing neutral amide backbone linkages, which is complementary to a target nucleic acid, under conditions wherein said oligomer engenders a biological response associated with said target in a sequence specific manner, and

b) detecting said biological response.

42 (New). The method of claim 41, wherein said polypeptide participates in cell signaling.

43 (New). The method of claim 41, wherein said biological response is a modification of polypeptide expression.

44 (New). The method of claim 43, wherein said modification is a reduction in polypeptide expression.

45 (New). The method of claim 41, wherein said biological response is characterized by a physiological change in said mammal.

46 (New). The method of claim 41, wherein said administration is an intraperitoneal administration.

47 (New). The method of claim 41, wherein said administration is an intraperitoneal administration.

48 (New). A method comprising administering to living cells in vivo a polyamide nucleic acid oligomer that contains neutral amide backbone linkages and is complementary to a target nucleic acid, under conditions wherein said oligomer engenders a biological response associated with said target in a sequence specific manner.

49 (New). The method of claim 48, wherein said method comprises detecting said biological response.

50 (New). The method of claim 48, wherein said cells are within a mammal.

51 (New). The method of claim 48, wherein said oligomer has sequence specificity for a nucleic acid sequence that regulates the expression of or encodes a polypeptide.

52 (New). The method of claim 51 wherein said polypeptide participates in cell signaling.

53 (New). The method of claim 48, wherein said biological response is a modification of polypeptide expression.

54 (New). The method of claim 53, wherein said modification is a reduction in polypeptide expression.

55 (New). The method of claim 48, wherein said biological response is characterized by a physiological change in a living organism.

56 (New). The method of claim 48, wherein said administration is an intraperitoneal administration.

57 (New). The method of claim 48, wherein said administration is extracellular.

58 (New). A method comprising:  
administering to a mammal a polyamide nucleic acid oligomer that contains neutral amide backbone linkages and is complementary to a target nucleic acid, under conditions wherein said oligomer engenders a biological response associated with said target in a sequence specific manner, and  
detecting said biological response.

59 (New). The method of claim 58, wherein said oligomer has sequence specificity for a nucleic acid sequence that regulates the expression of or encodes a polypeptide.

60 (New). The method of claim 59, wherein said polypeptide participates in cell signaling.

61 (New). The method of claim 58, wherein said biological response is a modification of polypeptide expression.

62 (New). The method of claim 61, wherein said modification is a reduction in polypeptide expression.

63 (New). The method of claim 58, wherein said biological response is characterized by a physiological change in said mammal.

64 (New). The method of claim 58, wherein said administration is an intraperitoneal administration.

65 (New). A method comprising administering to a organism a polyamide nucleic acid oligomer that contains neutral amide backbone linkages and is complementary to a target nucleic acid, under conditions wherein said oligomer specifically binds to DNA or RNA deriving from a gene in said organism.

66 (New). The method of claim 65 further comprising detecting expression of said gene following said administration.

67 (New). The method of claim 65 wherein said organism is a mammal.

68 (New). The method of claim 65 wherein said DNA or RNA regulates the expression of or encodes a polypeptide.

69 (New). The method of claim 68 wherein said polypeptide participates in cell signaling.

70 (New). The method of claim 65 wherein said administration modifies polypeptide expression in said organism.

71 (New). The method of claim 70 wherein said modification is a reduction in polypeptide expression.

72 (New). The method of claim 65 wherein said administration is an intraperitoneal administration.

73 (New). The method of claim 65 wherein said administration produces a biological response in said organism.